

Problems affecting availability of food may be a final wake-up call for environmental issues, Brown said. The world's oceans are being fished at their limits or beyond and are also beset by water pollution, coral reef degradation, and other environmental damage, he said. Farmers also are struggling to keep up with population growth. Land is becoming scarce, as is the water needed to grow crops. Water scarcity in China has forced farmers there to return to rain-fed farming, Brown said. And land scarcity could set back advances in more environmentally friendly energy sources, Brown noted. As food supplies dwindle and demand rises, for example, less grain will be available to make ethanol as a cleaner alternative to gasoline. The United States should adopt a national policy outlining a commitment to stabilizing world population, Brown said.

Some of the subsequent technical sessions at the conference echoed Brown's theme, specifically those dealing with sustainable development and ecosystem management. Jim Benson of the Natural Resources Conservation Service at the U.S. Department of Agriculture in Washington provided data on the impact of environmental problems on agriculture. The agency's National Resources Inventory, a study of 1.5 billion acres of nonfederal land, states that the available acreage of prime farmland fell from 339 million to 333 million acres between 1982 and 1992. Almost one out of every four cropland acres were eroding too fast to sustain soil productivity, Benson added. The NRI should help guide federal policy and provide up-to-date information on natural resource conditions, he said.

At the conference, the President's Council on Environmental Quality and NAEP awarded their third annual Federal Environmental Quality Awards, which honor federal agencies for excellence in implementing the National Environmental Policy Act, enacted 25 years ago. The Fort Worth District Army Corps of Engineers won the award for its project, a programmatic environmental impact statement of Joint Task Force Six activities along the U.S.-Mexico border. The project was organized in 1989 in response to the National Drug Control Strategy. Joint Task Force Six is a multforce government agency charged with providing technical, logistical, operational, and engineering support to federal, state, and local law enforcement agencies throughout the southwestern United States.

The U.S. Department of Energy won the award for the continued improvement of its National Environmental Policy Act

Compliance Program. Secretary of Energy Hazel O'Leary has taken bold steps to reinvent the DOE's National Environmental Policy Act program and has brought a change of culture and instilled in senior managers a commitment to openness and public participation in environmental decision-making, NAEP officials said.

NAEP, which began as a 350-member, interdisciplinary professional society in 1975, now boasts 3,300 members. It is the only overarching professional society serving the environmental professions and promotes ethical practices, technical competence, and professional standards for the environmental professions. A top goal of the group, said NAEP President Richard B. McLean, is supporting innovative and cost-effective environmental technologies.

New Rules for Medical Waste

The EPA estimates that its new proposed standards and guidelines for medical waste incinerators (MWIs) will reduce air pollution from the nation's 3,700 operating MWIs by 95% over 5 years.

EPA's proposal, *Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Medical Waste Incinerators*, implements sections 111(b) and 129 of the 1990 Clean Air Act amendments. Section 129 requires the EPA administrator to establish performance standards for MWIs. Published in the February 27 *Federal Register*, the proposal targets emissions of dioxins, hydrogen chloride, lead, cadmium, mercury, and fly and bottom ash emissions from MWIs. Along with commercial medical waste incineration facilities, the new regulation mainly will affect hospitals, which produce more than 70% of the 3.4 million tons of

medical waste generated in the United States each year. It will also affect nursing homes, veterinary facilities, commercial research laboratories, and bloodbanks, and the estimated 700 new MWIs installed over the next 5 years.

The EPA defines medical waste as solid waste generated when humans or animals are treated, diagnosed, or immunized, and when researchers produce or test biologicals—preparations like vaccines or cultures made from living organisms and their products.

Every year in the United States, according to the EPA, hospitals generate an estimated 2.5 million tons of solid waste, 15% of which is infectious. Laboratories, clinics, and medical offices generate even more biomedical waste, which can be anything from bandages, vials, syringes, hypodermic needles, and plastic tubing to blood, laboratory cell cultures, and human and animal tissues.

Unless the waste is treated, state and local governments usually prohibit municipal landfills from accepting it, prompting hospitals to either treat infectious waste on site or ship it to a hazardous-waste facility. Consequently, many hospitals own or share incineration facilities.

David Driesen, an attorney with the Natural Resources Defense Council (NRDC), says his organization would like to see the proposal require more pollution prevention. "A trend over the last few years has been toward good pollution alternatives and, at the state level, the closing down of small, uncontrolled incinerators at hospitals in favor of better-controlled regional facilities, often with the cooperation of hospitals," Driesen says. "The measure of success for this rulemaking is whether it will accelerate that trend."

Numerical Emission Limits

New and Existing MWIs

Particulate matter (PM):	30 milligrams per dry standard cubic meter (mg/dsm ³).
Carbon monoxide:	50 parts per million by volume (ppmv), dry basis.
Dioxins/furans:	80 ng/dsm ³ total dioxins/furans, or 1.9 ng/dsm ³ toxic equivalency (TEQ), determined by measuring the total dioxins/furans congener concentration and adjusting the results to account for each congener's toxicity.
Hydrogen chloride:	42 ppmv, dry basis, or 97% reduction.
Sulfur dioxide:	45 ppmv, dry basis.
Nitrogen oxides:	210 ppmv, dry basis.
Lead:	0.10 mg/dsm ³ .
Cadmium:	0.05 mg/dsm ³ .
Mercury:	0.47 mg/dsm ³ , or 85% reduction.
Fly ash/bottom ash:	0% opacity from any fly ash or bottom ash storage or handling area on facility property.

In an April 28 statement to the EPA, the Chicago-based American Hospital Association (AHA) said it supports "the enactment of reasonable regulations that are necessary to protect the environment and public health. However, the proposed regulations appear to be overly restrictive, unnecessarily costly, and burdensome," with no significant environmental improvements or reduced risks, the statement said. AHA has more than 5,000 member hospitals and health systems and 50,000 personal members.

At the EPA Emission Standards Division in Research Triangle Park, North Carolina, Rick Copland says examiners will take a close look at all comments, including those from AHA "to see how they developed their cost estimation."

Medical waste incinerators are subject to widely varying state and local regulations. An April 1990 EPA survey showed that 38 states had MWI-specific regulations or permit guidelines in place or on the drawing board. The other states regulate MWIs under less stringent general incinerator requirements.

Subpart Cc of the new regulation proposes emission guidelines and compliance schedules for states to use in developing regulations to control existing MWI emissions. The proposed guidelines establish emission limits for specific pollutants (see table) and set out additional requirements. Facilities must train and qualify MWI operators and develop and annually update site-specific training manuals for each MWI. Annual testing and monitoring must be performed to show compliance with emission limits for dioxins, particulate matter, cadmium, lead, mercury, carbon monoxide, and hydrogen chloride. "With respect to dioxins," NRDC's Driesen emphasizes, "there is evidence it is already at potentially unsafe levels in human bodies. Mercury similarly is a pollutant that accumulates, causes water pollution, and moves up the food chain. Some pollutants tend to dissipate. This group has serious health consequences. We need to reduce their amounts *and* avoid adding them to the environment." Most dioxin sources have not yet been identified, Driesen adds. "But the data we do have say medical waste incinerators are right up there in terms of generating dioxins."

A continuous emissions monitoring system (CEMS) would track opacity and carbon monoxide emissions. The guidelines require monthly opacity testing to determine compliance with fly and bottom ash emissions. An annual stack test would monitor emissions of other pollutants. If an MWI passed all three annual compli-

ance tests in a three-year period, the MWI could forego testing for that pollutant for the next two years. MWI facilities must either comply with a state plan within one year after the EPA approves the plan or comply with the state plan within three years after the EPA approves the state plan if the owner/operator documents and submits measurable, enforceable steps it will take to comply with the state plan. Finally, facilities must comply with operator training and qualification and inspection requirements within one year after the EPA approves a state plan.

In addition to the provisions for existing MWIs, the proposed regulation would also cover emissions from new MWIs. The rule would regulate site-selection for MWIs built after the final rule effective date, including a requirement of comprehensive air quality analysis and analysis of the potential effect of air, ground, and water pollution on visibility, soils, and vegetation. Facilities would submit results to the EPA and state and local officials, make results available to the public, and provide for a public meeting and prepare a comment and response document.

Driesen says his organization looks to the proposed rule for pollution-prevention incentives that do more than set standards. "The proposal was weak in that regard," he adds. "We're looking for requirements that encourage recycling, incineration alternatives, and pollution prevention efforts. The proposed regulations mention alternatives but don't require that anyone do anything with regard to pollution prevention. Emission standards seem to be aimed at accommodating waste streams that could be cleaner in the first place."

General standards would probably improve things, Driesen concludes, "but they fall short of state requirements for maximum achievable emission reductions. A well-controlled facility can do a lot better than what EPA is proposing."

"Individual incinerators emitted less than our proposed standards," EPA's Copland says, "but when we set a standard it has to be achievable by all incinerators. We feel the proposed standards are as stringent as our data would support." Copland adds, "This was a proposal. No one is required to do anything yet. We are taking comments and reassessing virtually everything. The final rule could look very different from the proposal." The final rule will take effect in April 1996.

Wayne Thomann, director of Occupational and Environmental Safety at Duke University Medical Center in Durham, North Carolina, says the newest MWI proposal won't affect his facility,

which began in 1992 to use "administrative controls to assure compliance with EPA's evolving regulations on chemical emissions that affect public health and the environment." Thomann says his facility no longer burns the plastics and heavy metals that release priority pollutants. In response to the EPA's 1990 Clean Air Act Amendments, he says, "We decided to change our waste mix. We didn't need to burn plastics and heavy metals. Now we won't burn anything but pathological waste, animal carcasses, and bedding." Duke now uses commercial contractors to dispose of hazardous waste. "Since we took ourselves out of the loop [for these hazardous emissions]," Thomann says, "we're doing as well or better than the emissions standards being proposed."

If the MWI standards and guidelines were to take effect as proposed, the EPA estimates the nationwide annual cost of waste incineration per unit of medical waste treated for new MWIs would increase from \$136 a ton to \$161 a ton. For existing MWIs, the cost of waste incineration per unit of waste treated would rise to \$222 a ton from the regulatory baseline cost of \$185 a ton.

In terms of costs to the hospital industry and, ultimately, to hospital patients, the EPA estimates that for new MWIs the industry would have to raise prices to cover higher waste disposal costs by an average 0.03% over current revenues of \$224 billion a year. For existing MWIs, this would mean an average price increase of 0.1% over current revenues. Put another way, AHA spokesperson Alicia Mitchell estimates total capital cost requirements for compliance could be as high as \$1.6 billion, and annual owning and operating costs could be as high as \$344 million per year.

The EPA believes medical waste generators now operating medical waste incinerators have three choices: continue to operate their on-site incinerator and comply with the proposed emission limits, install an alternative medical waste treatment technology on site, such as autoclave, microwave or chemical treatment, or contract with a commercial medical waste disposal service for off-site treatment and disposal of medical waste. For existing MWIs, the EPA estimates 80% of facilities now burning waste on site will switch to another treatment and disposal method to avoid the cost of installing air pollution control equipment.

Selenium Secrets

An ounce of prevention is said to be worth a pound of cure, but little is understood about the mechanisms of cancer that might be targeted as prevention strategies.